AMENDMENTS TO THE SPECIFICATION

In the Specification:

Please amend the specification as follows. Insertions appear as underlined text (e.g., insertions) while deletions appear as strikethrough text (e.g., ~~strikethrough~~). All previously amended claims appear as clean text.

Please amend paragraph [0023] as follows:

[0023] The operator can then make further adjustments to the virtual catheter tip position and the sequence of steps ii through vii are repeated in a way that is smooth and continuous to the user. In addition, throughout this procedure, feedback from the servo system control apparatus creates command logic when the actual catheter tip encounters an obstacle or resistance in its path. The command logic is used to control stepper motors physically coupled to the virtual catheter tip. The stepper motors are engaged to create resistance in the appropriate direction(s) that can be felt by the operator, and tactile feedback is thus provided to the surgeon.

One embodiment includes an apparatus for controlling the movement of a catheter-like tool to be inserted into the body of a patient, comprising a controllable magnetic field source having a first cluster of poles and a second cluster of poles, said first cluster of poles substantially opposed to said second cluster of poles, a tool having a distal end responsive to said magnetic field; and one or more magnetic sensors to sense a magnetic field produced by said distal end. In one embodiment, the first cluster of poles is connected to said second cluster of poles by a magnetic material. One embodiment includes an apparatus for generating a magnetic field, comprising a first cluster of first electromagnet poles provided to a mass of magnetic material, a first plurality of electromagnet coils provided to said first electromagnet poles, said first plurality of electromagnet coils controllable on a substantially separate basis, a second cluster of second electromagnet

poles provided to said mass of magnetic material such that said second cluster of second electromagnet poles substantially opposes said first cluster of first electromagnet poles, said magnetic mass completing a magnetic circuit from said first cluster said second cluster; and a second plurality of electromagnet coils provided to said second electromagnet poles, said second plurality of electromagnet coils controllable on a substantially separate basis such that an orientation of a magnetic field in a region between said first cluster and said second cluster is controllable in multiple dimensions.